an alkyl or aromatic organic [a] spacer molecule bound to the binding group [surface]; and

a carbohydrate derivative, O-, N-, C-, or S-glycosidically bound to the spacer molecule, which carbohydrate derivative specifically binds in a sample to at least one member selected from the group consisting of a protein, a virus and a cell.

2 ~~23.~~ (Amended) The biosensor according to claim 1 ~~22,~~ wherein said carbohydrate derivative is a [biologically active part] fragment of a naturally occurring carbohydrate sequence, which fragment binds in a biospecific manner to at least one member selected from the group consisting of a protein, a virus and a cell.

6 ~~24.~~ (Amended) The biosensor according to claim 1 ~~22,~~ wherein said binding group [spacer] is chemically bound or is bound via adsorption to the surface of the biosensor.

7 ~~25.~~ The biosensor according to claim 1 ~~22,~~ wherein said surface comprises a signal transducer.

10 ~~26.~~ The biosensor according to claim 1 ~~22,~~ wherein said surface comprises a means for monitoring a physical signal.

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11 ~~27~~. The biosensor according to claim ~~26,~~ 10 wherein said means for monitoring a physical signal is at least one member selected from the group consisting of a photometer, a chemical electrode, an electrochemical electrode, a temperature signal transducer, and a pressure signal transducer.

3 ~~28~~. (Amended) The biosensor according to claim ~~23,~~ 2, wherein the fragment of a naturally occurring carbohydrate sequence [said biologically active carbohydrate derivative] is a member selected from the group consisting of a mono-, di-, tri-, tetra-, or penta-saccharide sequence.

4 ~~29~~. (Twice Amended) The biosensor according to claim ~~23,~~ 2 wherein the fragment of a naturally occurring carbohydrate sequence [said biologically active carbohydrate derivative] selectively binds to at least one member selected from the group consisting of a lectin, an antibody against a carbohydrate, a cancer cell, a protein associated with a blood group determinant, a pathogenic bacteria, a pathogenic virus, a pathogenic toxin, a protein associated with an inflammatory reaction, and a cell associated with an inflammatory reaction.

d2

5 ~~30~~. (Amended) The biosensor according to claim ~~23,~~ 2 wherein the fragment of a naturally occurring carbohydrate sequence [said carbohydrate derivative] binds to P-fimbriated E. coli.

14

12
~~31~~. The biosensor according to claim 1 ~~22~~, wherein said carbohydrate derivative comprises at least one component selected from the group consisting of hexosamine-, fucose-, galactose-, glucose-, mannose-, xylose-, a N-acetylneuraminic acid residue, and analogs thereof.

13
~~32~~. The biosensor according to claim 12 ~~31~~, wherein the carbohydrate derivative has been derivatized in at least one hydroxyl group or amino group thereof with an organic or inorganic group.

14
~~33~~. The biosensor according to claim 1 ~~22~~, in which the carbohydrate derivative contains at least one O-, N-, S-, or C-glycosidically bound aglycon.

15
~~34~~. The biosensor according to claim 14 ~~33~~, in which the aglycon contains at least one aliphatic or aromatic compound.

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16
~~35~~. (Amended) The biosensor according to claim 14 ~~34~~ ~~33~~, in which the aglycon part of the carbohydrate derivative contains an amino acid ~~component~~ [-], peptide ~~component~~[-], or protein molecule ~~component~~.

a3

17
~~26~~. (Amended) The biosensor according to claim 1 ~~22~~, in which the carbohydrate derivative comprises at least one of a glycoprotein and [or] a neoglycoprotein.

15

18 ~~37~~. The biosensor according to claim ~~22~~ 1, wherein said surface is operably associated with an optical sensor which gives a signal change upon binding of a protein, a virus or a cell to the carbohydrate derivative bound via the spacer to the surface.

19 ~~38~~. The biosensor according to claim ~~37~~ 18, wherein the optical sensor functions by at least one method selected from the group consisting of surface plasmon changes, ellipsometry, reflection measurement and polarization measurement.

20 ~~39~~. The biosensor according to claim ~~22~~ 1, in which the surface is operably associated with a member selected from the group consisting of a piezoelectric crystal, an electrochemical electrode and a thermistor.

21 ~~40~~. The biosensor according to claim ~~22~~ 1, wherein said surface of the biosensor comprises gold.

22 ~~43~~. (Amended) A method of using the biosensor according to claim ~~22~~ 1 to determine the presence or amount of a protein, a virus or a cell, comprising the steps of:

d4

exposing the biosensor to a sample containing a protein, a virus or a cell to be measured,

binding a protein, virus or cell to the biosensor, <u>and</u>

measuring the presence or amount of the protein, virus or cell in the sample.

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d5

27 ~~45~~. (Amended) The immobilized carbohydrate derivative biosensor according to claim 1 ~~22~~ [44], further comprising a protein which is linked between the spacer molecule and the <u>binding group</u> [biosensor surface].

~~46. The biosensor according to claim 22, wherein said spacer comprises albumin.~~

J

~~47. The biosensor according to claim 22, wherein said spacer comprises a protein.~~

8 ~~48~~. The biosensor according to claim 7 ~~25~~, wherein said signal transducer is a chemical transducer.

9 ~~49~~. The biosensor according to claim 7 ~~25~~, wherein said signal transducer is a physical transducer.

Please add new claims 50-84, as follows:

44 --~~50~~. The immobilized carbohydrate derivative biosensor according to claim 1 ~~22~~, further comprising a protein which is linked between the binding group and the biosensor surface.

d6

28 ~~51~~. The biosensor according to claim 27 ~~45~~, wherein said carbohydrate derivative is a fragment of a naturally occurring carbohydrate sequence, which fragment binds in a biospecific manner to at least one member selected from the group consisting of a protein, a virus and a cell.

17

~~52~~ 45. The biosensor according to claim ~~50~~ 44, wherein said carbohydrate derivative is a fragment of a naturally occurring carbohydrate sequence, which fragment binds in a biospecific manner to at least one member selected from the group consisting of a protein, a virus and a cell.

~~53~~ 31. The biosensor according to claim ~~45~~ 27, wherein said surface comprises a signal transducer.

~~54~~ 48. The biosensor according to claim ~~50~~ 44, wherein said surface comprises a signal transducer.

a6 cont.

~~55~~ 32. The biosensor according to claim ~~45~~ 27, wherein said surface comprises a means for monitoring a physical signal.

~~56~~ 49. The biosensor according to claim ~~50~~ 44, wherein said surface comprises a means for monitoring a physical signal.

~~57~~ 33. The biosensor according to claim ~~55~~ 32, wherein said means for monitoring a physical signal is at least one member selected from the group consisting of a photometer, a chemical electrode, an electrochemical electrode, a temperature signal transducer, and a pressure signal transducer.

50 ~~58~~. The biosensor according to claim 49 ~~56~~, wherein said means for monitoring a physical signal is at least one member selected from the group consisting of a photometer, a chemical electrode, an electrochemical electrode, a temperature signal transducer, and a pressure signal transducer.

30 ~~59~~. The biosensor according to claim 28 ~~51~~, wherein the fragment of a naturally occurring carbohydrate sequence is a member selected from the group consisting of a mono-, di-, tri-, tetra-, or penta-saccharide sequence.

46 ~~60~~. The biosensor according to claim 45 ~~52~~, wherein the fragment of a naturally occurring carbohydrate sequence is a member selected from the group consisting of a mono-, di-, tri-, tetra-, or penta-saccharide sequence.

29 ~~61~~. The biosensor according to claim 28 ~~51~~, wherein the fragment of a naturally occurring carbohydrate sequence selectively binds to at least one member selected from the group consisting of a lectin, a cancer cell, a protein associated with a blood group determinant, a pathogenic bacteria, a pathogenic virus, a pathogenic toxin, a protein associated with an inflammatory reaction, and a cell associated with an inflammatory reaction.

47 ~~62~~. The biosensor according to claim 45 ~~52~~, wherein the fragment of a naturally occurring

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carbohydrate sequence selectively binds to at least one member selected from the group consisting of a lectin, a cancer cell, a protein associated with a blood group determinant, a pathogenic bacteria, a pathogenic virus, a pathogenic toxin, a protein associated with an inflammatory reaction, and a cell associated with an inflammatory reaction.

34 ~~63~~. The biosensor according to claim 27 ~~45~~, wherein said surface is operably associated with an optical sensor which gives a signal change upon binding of a protein, a virus or a cell to the carbohydrate derivative.

C6 cont

51 ~~64~~. The biosensor according to claim 44 ~~56~~, wherein said surface is operably associated with an optical sensor which gives a signal change upon binding of a protein, a virus or a cell to the carbohydrate derivative.

35 ~~65~~. The biosensor according to claim 34 ~~63~~, wherein the optical sensor functions by at least one method selected from the group consisting of surface plasmon changes, ellipsometry, reflection measurement and polarization measurement.

52 ~~66~~. The biosensor according to claim 51 ~~64~~, wherein the optical sensor functions by at least one method selected from the group consisting of surface plasmon changes, ellipsometry, reflection measurement and polarization measurement.

36 ~~67~~. The biosensor according to claim 27 ~~45~~, in which the surface is operably associated with a member selected from the group consisting of a piezoelectric crystal, an electrochemical electrode and a thermistor.

53 ~~68~~. The biosensor according to claim 44 ~~50~~, in which the surface is operably associated with a member selected from the group consisting of a piezoelectric crystal, an electrochemical electrode and a thermistor.

37 ~~69~~. The biosensor according to claim 27 ~~45~~, wherein said surface of the biosensor comprises gold.

54 ~~70~~. The biosensor according to claim 44 ~~50~~, wherein said surface of the biosensor comprises gold.

38 ~~71~~. A method of using the biosensor according to claim 27 ~~45~~ to determine the presence or amount of a protein, a virus or a cell, comprising the steps of:

exposing the biosensor to a sample containing a protein, a virus or a cell to be measured,

binding a protein, virus or cell to the biosensor, and

measuring the presence or amount of the protein, virus or cell in the sample.

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~~72~~. A method of using the biosensor according to claim ~~50~~ 44 to determine the presence or amount of a protein, a virus or a cell, comprising the steps of:

exposing the biosensor to a sample containing a protein, a virus or a cell to be measured,

binding a protein, virus or cell to the biosensor, and

measuring the presence or amount of the protein, virus or cell in the sample.

23 1
~~73~~. The biosensor according to claim ~~22~~, wherein:

the spacer molecule comprises an alkyl chain of the type $(-CH_2)_n$, in which n is an integer from 2 to 8.

Cl 6 cont

39 27
~~74~~. The biosensor according to claim ~~45~~, wherein:

the spacer molecule comprises an alkyl chain of the type $(-CH_2)_n$, in which n is an integer from 2 to 8.

56 44
~~75~~. The biosensor according to claim ~~50~~, wherein:

the spacer molecule comprises an alkyl chain of the type $(-CH_2)_n$, in which n is an integer from 2 to 8.

24 1
~~76~~. The biosensor according to claim ~~22~~, wherein:

22

the spacer molecule comprises an aromatic group-containing structure; and

the binding group comprises a member selected from the group consisting of -S-, -NH-CO-, -CO-NH-, -NH-, and -N=N-.

40 27
~~77~~. The biosensor according to claim ~~45~~, wherein:

the spacer molecule comprises an aromatic group-containing structure; and

the binding group comprises a member selected from the group consisting of -S-, -NH-CO-, -CO-NH-, -NH-, and -N=N-.

a6 cont

57 44
~~78~~. The biosensor according to claim ~~56~~, wherein:

the spacer molecule comprises an aromatic group-containing structure; and

the binding group comprises a member selected from the group consisting of -S-, -NH-CO-, -CO-NH-, -NH-, and -N=N-.

25 1
~~79~~. The biosensor according to claim ~~22~~, wherein a chemical group is present between the surface and the binding group.

26 25
~~80~~. The biosensor according to claim ~~79~~, wherein the chemical group is a -CO-CH_2CH_2-S- group.

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